IN THE CLAIMS:

1.   (Canceled)

2.   (Canceled)

3.   (Currently Amended) A vector-controlled, dual inverter system for a three-phase induction motor, comprising:

a first inverter system adapted to be coupled to one end of three-phase windings of a stator and configured to compensate back electromotive force, in which the first inverter system interconnects a battery and a three-phase induction motor, and the second inverter system interconnects a capacitor and the three-phase induction motor; and

a second inverter system adapted to be coupled to the other end of the three-phase windings of the stator and configured to compensate reactive power,

~~The vector-controlled, dual inverter system of claim 2,~~

wherein the first inverter system comprises:

a q-axis current controller configured to provide proportional integral control based on a difference between a q-axis current command and a q-axis current, compensating back EMF, and generating a first q-axis voltage command;

a magnetic flux controller configured to provide proportional integral control based on a difference between a magnetic flux command and magnetic flux, and generating a d-axis current command;

a d-axis current controller configured to provide proportional integral control based on the difference between the d-axis current command and the d-axis current, and generating a first-d axis voltage command;

a first d-q/three-phase coordinate converter adapted to receive the first q-axis voltage command and the first d-axis voltage command, and configured to convert the first q-axis voltage command and the first d-axis voltage command to a first three-phase voltage command;

a first inverter configured to convert Direct Current (D.C.) power to Alternating Current (A.C.) power based on the first three-phase voltage command to the three-phase induction motor; and

a first three-phase/d-q coordinate converter configured to detect the three-phase currents flowing from the first inverter to the three-phase induction motor and converting the three-phase currents to a q-axis current and a d-axis current,

wherein the second inverter system comprises:

a voltage controller configured to provide proportional integral control based on a difference between a DC-link capacitor voltage command and a DC-link capacitor voltage to estimate a voltage command vector and dividing the voltage command vector into a d-axis component and a q-axis component;

a reactive voltage compensator compensating a d-axis component and a q-axis component and providing a second d-axis voltage command and a second q-axis voltage command;

a second d-q/three-phase coordinate converter receiving the second q- axis voltage command and the second d-axis voltage command and converting them to a second three-phase voltage command; and

a second inverter converting D.C. power to A.C. power based on the second three-phase voltage command to the three-phase induction motor.

4.   (Original) The system of claim 3, wherein the back EMF compensation is performed based on the equation described below:

$$\text{Compensation voltage for back EMF} = w_e \frac{L_m}{L_r} \lambda_{dr}^e$$

wherein w_e : angular velocity of the rotor

$\quad\quad\quad L_m$: mutual inductance

$\quad\quad\quad L_r$: rotor inductance

$\quad\quad\quad \lambda_{dr}^e$: magnetic flux of rotor

5.   (Original) The system of claim 3, wherein the second d-axis voltage command and the second q-axis voltage command provided by the reactive voltage compensator are determined based on the equations described below:

$$v_{ds2}^{e*} = \frac{i_{ds}^{e}}{\| i_s \|}\left(k_{vp} + \frac{k_{iv}}{s} \right)(v_{dc2}^{*} - v_{dc2}) + \omega_e \sigma L_s i_{qs}^{e}$$

$$v_{qs2}^{e*} = \frac{i_{qs}^{e}}{\| i_s \|}\left(k_{vp} + \frac{k_{iv}}{s} \right)(v_{dc2}^{*} - v_{dc2}) - \omega_e \sigma L_s i_{ds}^{e}$$

wherein v_{ds2}^{e*} : second d-axis voltage command value

                 v_{qs2}^{e*} : second q-axis voltage command value

                 i_{ds}^{e} : d-axis current command

                 i_{qs}^{e} : q-axis current command

                 v_{dc2}^{*} : DC-link capacitor voltage command

                 v_{dc2} : DC-link capacitor voltage

                 k_{vp} : proportional control gain

                 k_{vi} : integral control gain

                 i_s : stator current

                 w_e : angular velocity of the rotor

                 σL_s : leakage inductance